KODAK WL Surveillance Film / 2210

KODAK WL Surveillance Film / 2210 is a high-speed, black-and-white negative camera film with extremely fine grain and high resolving power, allowing a high degree of enlargement. It is especially useful for dimly lit subjects exposed in daylight or artificial light.

This 400-speed film has a wide exposure latitude, which allows quality prints from moderately under- (EI 800) or overexposed (EI 150) negatives. You can expose this film at speeds up to EI 3200 with push processing in KODAK PROFESSIONAL T-MAX Developers.

KODAK WL Surveillance Film / 2210 is formatted on ESTAR-AH base, a tough, dimensionally stable polyester support with an optical density of 0.10 for protection against light-piping. A fast-drying backing allows processing in high-speed processors.

IMAGE STRUCTURE

Based on development in KODAK Developer D-76, at 20°C (68°F).

Diffuse RMS Granularity: 10 (Extremely Fine)

Read at a net diffuse visual density of 1.0, 48 micrometre aperture.

Resolving Power:

ISO-RPL	TOC 1.6:1	50 line pairs/mm	
ISO-RP	TOC 1000:1	125 line pairs/mm	High

SUPPORT

Dimensionally stable 0.004-inch (0.10 mm) ESTAR Base.

SAFELIGHT

NONE; handle in total darkness.

STORAGE AND HANDLING

Keep unexposed film and processed film in a cool, dry place. Process film as soon as possible after exposure.

To avoid moisture condensation on film that has been refrigerated, allow 16 mm film to stand at room temperature for at least 1 to 1.5 hours before removal from the package; for 35 mm film, allow 2 to 3 hours and for 70 mm film, 4 to 5 hours.

Load and unload camera in subdued light. Process exposed film promptly after exposure. Always protect processed negatives from strong light and store in a cool, dry place.

EXPOSURE

The developer you use to process this film affects the exposure index:

Exposure Index Arithmetic / Logarithmic*	KODAK Developer
400 / 27	T-MAX
400 / 27	T-MAX RS
400 / 27	D-76
400 / 27	D-76 (1:1)
320 / 26	HC-110 (Dil B)
400 / 27	DURAFLO RT
200 / 24	MICRODOL-X
320 / 26	MICRODOL-X (1:3)

Reciprocity

Exposure Time (seconds)	Adjust Either		
	Lens Aperture	Or	Exposure Time
1/10,000	None		None
1/1000	None		None
1/100	None		None
1/10	None		None
1	+1/3 stop		Change Aperture
10	+1/2 stop		15
100	+1 1/2 stop		300

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PROCESSING

Notice: Observe precautionary information on product labels and Material Safety Data Sheets.

Tank development times shorter than 5 minutes may result in unsatisfactory uniformity. Do not develop this film by inspection—KODAK WL Surveillance Film has a higher level of green sensitizing dye that results in an increased sensitivity to safelight illumination.

These times are starting-point recommendations. Make tests to determine the best development time.

Small Tank (8- or 16-ounce), Agitation at 30-second Intervals, Development Time in Minutes

KODAK Developer	65°F (18°C)	68°F (20°C)	70°F (21°C)	72°F (22°C)	75°F (24°C)
T-MAX	NR	7	6½	6½	6*
T-MAX RS	NR	7	6	6	5*
D-76	9	8*	7	6½	5½
D-76 (1:1)	14½	12½*	11	10	9
HC-110 (dil B)	6½	6*	5½	5	4½
MICRODOL-X	12	10½*	9	8½	7½
MICRODOL-X (1:3)	NR	NR	20	18½	16*
T-MAX (1:9)†	NR	NR	NR	NR	15*

* Primary time/temperature recommendation.

† Using T-MAX Developer diluted 1:9 provides good processing control, slightly more speed, no change in contrast or grain, and a larger capacity of film per gallon of developer concentrate. To mix, dilute the working solution of T-MAX Developer with an equal part of water, or dilute the concentrate by mixing one part of the concentrate with nine parts water (1:9).

NR = Not Recommended

Large Tank, Agitation at 1-minute Intervals, Development Time in Minutes

KODAK Developer	65°F (18°C)	68°F (20°C)	70°F (21°C)	72°F (22°C)	75°F (24°C)
T-MAX	NR	7	6½	6½	6*
T-MAX RS	NR	8½	8	7½	7*
D-76	10	9*	8	7½	6½
HC-110 (dil B)	8	7*	6½	6	5
MICRODOL-X	13	11½*	10	9	8

* Primary time/temperature recommendation.

NR = Not Recommended

Rinse
Rinse at 65 to 75°F (18 to 24°C) with agitation.

KODAK Indicator Stop Bath	30 seconds
or diluted 4% acetic acid solution	30 seconds

Fix
Fix at 65 to 75°F (18 to 24°C) with frequent agitation.

KODAK Rapid Fixer*	3 to 5 minutes
KODAK Fixer	5 to 10 minutes
KODAFIX Solution	5 to 10 minutes

* Primary fixer recommendation.

Note: Fixer may exhaust more rapidly with this film than with other films. Use fresh fixer. If negatives show a magenta (pink) stain after fixing, the fixer may be near exhaustion or a longer fix time is needed. If the stain is slight, it will have no printing effect. If it is pronounced and irregular over the film surface, refix the film in fresh fixer. Another way to remove the dye stain is to bathe the film in KODAK Hypo Clearing Agent for 2 minutes at 65 to 75°F (18 to 24°C) and follow with a 5 minute wash.

Wash
Wash at 65 to 75°F (18 to 24°C) in running water for about 20 to 30 minutes.

Dry
Dry in a dust-free place.

Push Processing
Push-processing allows film to be exposed at higher exposure indices. However, it does not produce optimum quality. Prints show a slight loss of shadow detail and increase in graininess.

The processing times to produce a CI of 0.74 for 2-stop push-processing are given in the following tables. Use these percentages for development not covered by the following tables:

KODAK Developer	Increased Developer Time
T-MAX	+30%
T-MAX RS	+40%
HC-110 (Dil B)	+30%
D-76	+20%
D-76 (1:1)	+15%
MICRODOL-X (1:3)	+20%
DURAFLO RT	+20%

Note: MICRODOL-X Developer (full strength) is not recommended for push processing.

Large Tank Processing
Large tank (1/2- to 3 1/2-gallon) (Rolls), agitation at 1-minute intervals, in KODAK T-MAX RS Developer and Replenisher:

Exposure Index	Development Time (Minutes)			
(EI)	68°F (20°C)	70°F (20°C)	72°F (22°C)	75°F (24°C)
400/800	8 1/2	8	7 1/2	7*
1600	12	11	10	9*
3200	NR	NR	NR	12*

* Primary time/temperature recommendation.
NR = Not Recommended.

Continuous Processing
Nominal development time, using KODAK DURAFLO RT Chemicals, to produce a Contrast Index of 0.56 at 26.5°C (80°F): 93 sec.

When processing this film in the KODAK VERSAMAT Film Processor, Model 11, Model 1140, Model 5, or Model 411, using KODAK DURAFLO RT Chemicals, use the following table.

KODAK VERSAMAT	Contrast Index	Machine Speed Setting (feet per minute)
Models 11 and 1140 (two racks)	0.56	5.5 fpm (approximately 93 seconds development)
Models 5 and 411 (one rack)	0.56	2.6 fpm (approximately 92 seconds development)

DIMENSIONAL STABILITY
Dimensional stability is an all-inclusive term. In photography, it applies to size changes caused by changes in humidity and in temperature, and by processing and aging. The absence of solvent in ESTAR Base is one of the reasons why ESTAR Base films show excellent dimensional stability. The dimensional properties of ESTAR Base may vary slightly in different directions within a sheet; the differences that may exist, however, are not always equal in both the length and width directions.

Differences in size change between length and width should be within 10 percent of each other.

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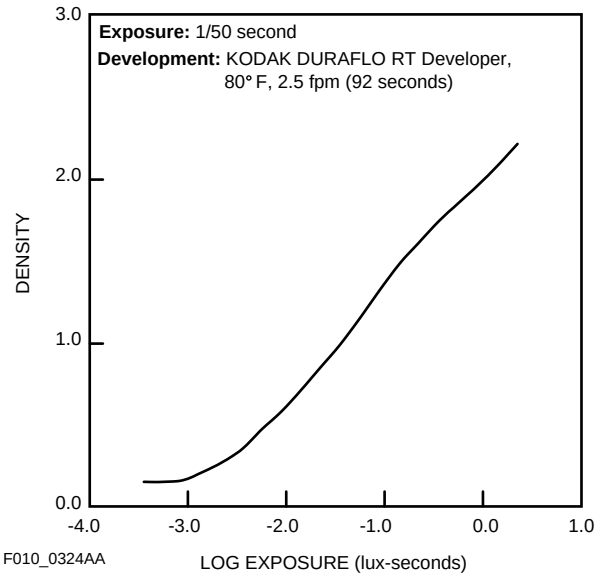
CURVES

Characteristic



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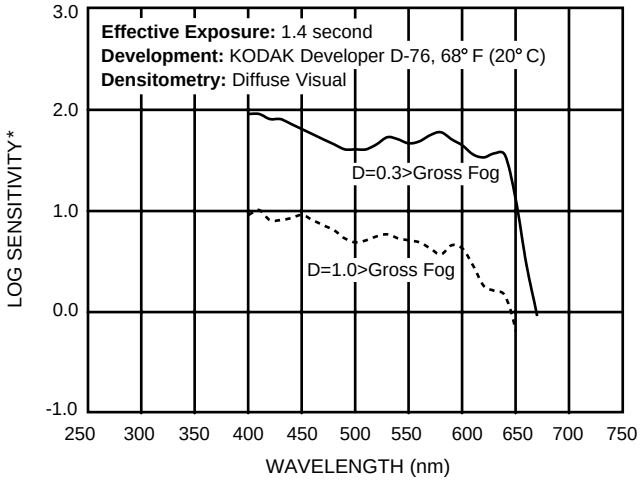
Spectral Sensitivity



*Sensitivity = reciprocal of exposure (erg/cm^2) required to produce specified density

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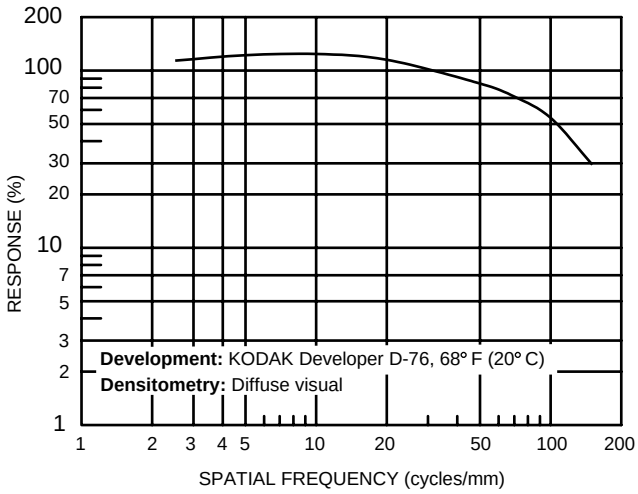
Modulation Transfer Function



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MORE INFORMATION

For the latest version of technical support publications for Kodak products, visit Kodak on-line at: **http://www.kodak.com/go/SDRproducts**
If you have questions about Kodak products, call Kodak. In the U.S.A.: 1-800-242-2424, Ext. 19, Monday–Friday 9 a.m.–7 p.m. (Eastern time) In Canada: 1-800-465-6325, Monday–Friday 8 a.m.–5 p.m. (Eastern time) From outside the US/Canada: 1-585-724-4000

Note: The Kodak materials described in this publication for use with KODAK WL Surveillance Film are available from dealers who supply Kodak products. You can use other materials, but you may not obtain similar results.

NOTICE: The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings, and therefore do not apply directly to a particular box or roll of photographic material. They do not represent standards or specifications that must be met by Eastman Kodak Company. The company reserves the right to change and improve product characteristics at any time.

Aerial and Industrial Materials
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KODAK WL Surveillance Film / 2210
KODAK Publication No. **TI-1838**

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New 4-04
Printed in U.S.A.